

## Exhibit A - - STATEMENT OF WORK

### I. GENERAL INFORMATION:

The United States Embassy in [Astana / Kazakhstan](#) requires professional services and contractor cost proposals to perform preventive maintenance services of the facility's chiller/s systems.

### II. PROJECT REQUIREMENTS:

#### DESCRIPTION OF EQUIPMENT \*:

*\*Please see attachment at the end of this sheet for more details*

### III. GENERAL REQUIREMENTS:

The Contractor under this SOW will be responsible for labor, tools, and materials required to carry out all preventive maintenance as outlined in this SOW. Embassy staff has service manuals for all chillers onsite.

### IV. SCOPE OF WORK - - [HVAC System PREVENTIVE MAINTENANCE](#)

Contractor shall provide all materials, supervision, labor, tools and equipment to perform preventive maintenance. All personnel working in the vicinity shall wear and use safety protection while all work is performed. Any questions or injuries **shall** be brought to the attention of the Post Occupation Safety and Health Officer (POSHO). Material Safety Data Sheets (MSDS) shall be provided by the Contractor for all HAZMAT materials. Copies will be provided to the COR for approval.

If any discrepancies are found with the HVAC equipment/systems that are not covered under this scope of work then the contractor must provide the following:

1. Detailed report noting the discrepancy found.
2. Bill of Materials (BOM) to include component name, quantity, part #, and price for any repair material required and material lead time.
3. Price quote for repair labor.

At a minimum, the following work shall be done:

## **Air Cooled Chiller:**

### Special Instructions-

1. Follow site safety procedures and supervisor's instructions.
2. Schedule outage with operating personnel. personnel (minimum 24 hours in advance of planned shutdown)
3. Use extreme caution when climbing roof access ladders.
4. Perform applicable lockout/tag out steps of site safety procedures.
5. Record and report equipment damage or deficiencies.
6. Review and follow the manufacturer's O&M instructions.
7. Follow safety and environmental procedures for the handling and disposing of refrigerants and compressor oil.
8. Don't vent refrigerants. Refrigerants must be recovered.
9. Record quantities of refrigerants and compressor oil, added or removed.
10. Record results in the equipment history log.
11. Check manufacturer's specifications for the maximum number of plugged tubes.

### Semi-Annual Schedule-

1. Check oil level in oil separator sight glass.
2. Check liquid line sight glass/moisture indicator.
3. Record system operating temperatures and pressures in the checklist.
4. Check programmable operating set points and safety cutouts. Assure they are correct for the application.
5. Check compressor and evaporator heater operation.
6. Check superheat on the evaporator and the economizer feed to the compressor.
7. Check condenser sub-cooling.
8. Check for dirt in the panel. Check door gasket for sealing integrity.

### Annual Schedule-

1. Sample compressor oil, check for acid, and replace if necessary.
2. Disconnect power source and lock out. Check tightness of power wiring connections.
3. Check the chiller for leaks.
4. Thoroughly clean the condenser coils.
5. Test fans for proper operation.

6. Perform operational test and return to service.
7. Remove debris from work-site.

### **Motor Starter (5 HP to Less Than 100 HP):**

#### Special Instructions-

1. Schedule outage with operating personnel. (minimum 24 hours in advance of planned shutdown)
2. Follow site safety procedures and your supervisor's instructions.
3. De-energize, tag, and lock out circuit. Check for secondary sources of voltage. DANGER – CHECK THAT CIRCUITS ARE DEAD BEFORE STARTING WORK.
4. Record and report to your supervisor any equipment damage or deficiencies found during this maintenance task.
5. Record all test results in the component maintenance log.
6. Obtain and review manufacturer's operation and maintenance instructions.
7. All tests shall conform to the manufacturer's recommended procedures.

#### Annual Schedule-

1. Complete RCM Procedure CM-0002 (Qualitative Infrared Testing).
2. Visually inspect for broken parts, contact arcing, or any evidence of overheating.
3. Check motor name plate for current rating and controller manufacturer's recommended heater size (report discrepancy to supervisor).
4. Check line and load connections for tightness (check manufacturer's instructions for torque specifications).
5. Check heater mounting screws for tightness.
6. Check all control wiring connections for tightness.
7. On units equipped with motor reversing capacity, check mechanical interlock.
8. On units equipped with two-stage starting, check dash pots and timing controls for proper operation. Adjust as required per the manufacturer's specifications.
9. On units equipped with variable speed starters:
10. Check tightness of connections to resistor bank.
11. Check resistor coils and plates for cracking, broken wires, mounting and signs of overheating. Clean as required.
12. Check tightness of connections to drum controller.
13. Check contacts of drum controller for arcing and overheating. Apply a thin film of lubricant to drum controller contacts and to rotating surfaces.
14. Check starter contact connections by applying a thin film of black contact grease to line and load stabs, operate contacts and check surface contact.
15. Lubricate all moving parts with proper lubricant.

16. Clean interior of cabinet.
17. Clean exterior of cabinet.
18. Energize circuit and check operation of starter and any pilot lights. Replace as required.

**Panel, Electronic Controls:**

Special Instructions-

1. Schedule outage with operating personnel. (minimum 24 hours in advance of planned shutdown)
2. Record and report equipment damage or deficiencies.
3. Record results in the equipment history log

Annual Inspection-

1. Clean panel interior.
2. Verify functionality of supported devices.
3. Clean ventilation filter and fan (if applicable).
4. Submit a Work Order to correct deficiencies.

2 Year Inspections-

1. Replace battery where applicable.

**Dry Cooler:**

Special Instructions:

1. Perform applicable lockout/tag out steps of site safety procedures to ensure machinery will not start.
2. Schedule outage with operating personnel. (minimum 24 hours in advance of planned shutdown)
3. Use extreme caution when climbing roof access ladders.
4. Follow site safety procedures and your supervisor's instructions.
5. Record and report to your supervisor any equipment damage or deficiencies found during this maintenance task.
6. Review and follow the manufacturer's O&M instructions.

#### Annual Inspection-

1. Remove debris from air screen and clean underneath unit.
2. Pressure wash coils with coil clean solution or water as required by the manufacturer's specifications.
3. Straighten fin tubes with fin comb.
4. Inspect controller for proper operation. Inspect electrical connections for tightness.
5. Inspect for and remove corrosion rust from unit and supporting steel, prime and paint as necessary.
6. Inspect and lubricate fan motors.
7. Cycle all valves at least two times.
8. Verify proper operation of fans.
9. Clean up work area.

#### Annual Schedule (AHU) Direct Drive, Outside Air

##### Maintenance Task Description:

1. Evaluate filters for replacement.
2. Service the condensate system.
3. Check, clean and inspect the air handling unit.

##### Procedures:

1. Pre-work operational tests with unit operating:
  - a. Check for unusual noise, vibration or leakage.
  - b. Perform vibration analysis. Record corrective measures if needed.
  - c. Perform thermal analysis. Record corrective measures if needed.
2. Stop the unit and service the unit casing and ducting:
  - a. Clean interior and exterior of unit with wiping cloth and a vacuum.
  - b. Inspect panels for damage.
  - c. Check and repair damaged insulation.
  - d. Check doors, handles, latches and hinges for proper operation.
  - e. Inspect door gaskets for damage and proper seal.
  - f. Check soundness of the unit structure.
  - g. Check, clean, and adjust grills, dampers, vanes, linkages as required.

- h. Check damper actuators and linkage for proper operation. Adjust linkage on dampers if out of alignment.
  - i. Inspect and lubricate mechanical connections of dampers sparingly if necessary.
  - j. Inspect air hood and air louvers for damage and debris.
  - k. Inspect bird screens for damage and debris. Remove dead birds.
  - l. Inspect mist eliminators for damage, dirt and debris.
3. Service the unit fans:
- a. Check fan housing, wheel, shaft, frame, and inlet vanes for damage, wear, loose parts, dirt and debris.
  - b. Check fan blades for dust buildup and clean if necessary.
  - c. Check fan blades and moving parts for cracks and excessive wear.
  - d. Check mounting bolts, set screws, etc. for security.
4. Service the coils and fluid systems:
- a. Inspect and clean coils if required. Don't use a pressure washer.
  - b. Check coils for leaking and adjust tightness of fittings when required. On direct expansion units, check for refrigerant leaks on all lines, valves, fittings, coils, etc. Submit a work order to repair any leaks found.
  - c. Use fin comb to straighten coil fins. (If required)
  - d. Flush and clean condensate pans and drains, remove all rust, prepare metal and paint where required. Treat condensate pans with an EPA approved biocide.
  - e. Ensure condensate drain lines are clear and free running. Service condensate pumps, if equipped.
  - f. Check and clean strainers.
  - g. Cycle all water valves two times.
  - h. Check filters and change if necessary.
5. Service the motors:
- a. Clean exterior of motor surfaces of soil accumulation.
  - b. Clean motor ventilation ports.
  - c. Check condition of extended lubrication lines when present.
  - d. Evaluate motor bearings and lubricate if necessary. (See manufacturer literature)
  - e. Check adjustable fan motor base and mounting hardware for loose parts. Tighten as necessary.
  - f. Check adjustable fan motor base for damage.
  - g. Check grounding straps for tightness.
  - h. Check motor insulation resistance. (Do not megger check variable speed drive units.)
  - i. Check for any other damage.
6. Perform operational and running checks:
- a. Check for unusual noise, vibration or leakage.
  - b. Check unit sensors for proper readout at the building automation system.
  - c. Perform vibration and thermal analysis to verify correction of any pre-test problems.

- d. Record motor running amps at 100 percent frequency and air loading.
- 7. Restore unit to service.
- 8. Clean up work area and remove trash.

#### Annual Schedule (AHU) Direct Drive

##### Maintenance Task Description:

- 1. Evaluate filters for replacement.
- 2. Service the condensate system.
- 3. Check, clean and inspect the air handling unit.

##### Procedures:

- 1) Pre-work operational tests with unit operating:
  - a. Check for unusual noise, vibration or leakage.
  - b. Perform vibration analysis. Record corrective measures if needed.
  - c. Perform thermal analysis. Record corrective measures if needed.
- 2) Stop the unit and service the unit casing and ducting:
  - a. Clean interior and exterior of unit with wiping cloth and a vacuum.
  - b. Inspect panels for damage.
  - c. Check and repair damaged insulation.
  - d. Check doors, handles, latches and hinges for proper operation.
  - e. Inspect door gaskets for damage and proper seal.
  - f. Check soundness of the unit structure.
  - g. Check, clean, and adjust grills, dampers, vanes, linkages as required.
  - h. Check damper actuators and linkage for proper operation. Adjust linkage on dampers if out of alignment.
  - i. Inspect and lubricate mechanical connections of dampers sparingly if necessary.
  - j. Inspect air hood and air louvers for damage and debris.
  - k. Inspect bird screens for damage and debris. Remove dead birds.
    - i. Inspect mist eliminators for damage, dirt and debris.
- 3) Service the unit fans:
  - a. Check fan housing, wheel, shaft, frame, and inlet vanes for damage, wear, loose parts, dirt and debris.
  - b. Check fan blades for dust buildup and clean if necessary.
  - c. Check fan blades and moving parts for cracks and excessive wear.
  - d. Check mounting bolts, set screws, etc. for security.

- 4) Service the coils and fluid systems:
  - a. Inspect and clean coils if required. Don't use a pressure washer.
  - b. Check coils for leaking and adjust tightness of fittings when required. On direct expansion units, check for refrigerant leaks on all lines, valves, fittings, coils, etc. Submit a work order to repair any leaks found.
  - c. Use fin comb to straighten coil fins. (If required)
  - d. Flush and clean condensate pans and drains, remove all rust, prepare metal and paint where required. Treat condensate pans with an EPA approved biocide.
  - e. Ensure condensate drain lines are clear and free running. Service condensate pumps, if equipped.
  - f. Check and clean strainers.
  - g. Cycle all water valves two times.
  - h. Check filters and change if necessary (pre-filters only on chem/bio units).
- 5) Service the motors:
  - a. Clean exterior of motor surfaces of soil accumulation.
  - b. Clean motor ventilation ports.
  - c. Check condition of extended lubrication lines when present.
  - d. Evaluate motor bearings and lubricate if necessary. (See manufacturer literature)
  - e. Check adjustable fan motor base and mounting hardware for loose parts. Tighten as necessary.
  - f. Check adjustable fan motor base for damage.
    - i. Check grounding straps for tightness.
    - ii. Check motor insulation resistance. (Do not megger check variable speed drive units.)
- 6) Perform operational and running checks:
  - a. Check for unusual noise, vibration or leakage.
  - b. Check unit sensors for proper readout at the building automation system.
  - c. Perform vibration and thermal analysis to verify correction of any pre-test problems.
  - d. Record motor running amps at 100 percent frequency and air loading.
- 7) Restore unit to service.
- 8) Clean up work area and remove trash.

#### Annual Schedule (AHU) Belt Drive

##### Maintenance Task Description:

1. Check, clean and inspect the air handling unit.

##### Procedures:



- 1) Pre-work operational tests with unit operating:
  - a. Check for unusual noise or vibration.
  - b. Perform vibration analysis. Record corrective measures if needed.
  - c. Perform thermal analysis. Record corrective measures if needed.
- 2) Stop the unit and clean/adjust:
  - a. Clean exterior of unit.
  - b. Inspect panels for damage.
  - c. Inspect air hoods and air louvers for damage and debris.
  - d. Inspect bird screens for damage and debris.
  - e. Inspect mist eliminators for damage, dirt and debris.
  - f. Check and clean grills, dampers, vanes, linkages as required.
  - g. Check damper actuators and linkage for proper operation. Adjust linkage on dampers if out of alignment.
  - h. Lubricate mechanical connections of dampers sparingly.
  - i. Vacuum interior of unit if necessary.
  - j. Check doors, handles, latches and hinges for proper operation.
  - k. Inspect door gaskets for damage and proper seal.
  - l. Check soundness of unit structure. (Is it falling apart?)
- 3) Service the fan:
  - a. Check belts for wear and cracks, adjust tension or alignment, and replace belts when necessary.
  - b. Check fan housing, wheel, shaft, frame, inlet vanes and bearings for damage, wear, loose parts, dirt and debris.
  - c. Check fan base, vibration isolators and thrust restraints for damage, wear, loose parts, dirt and debris.
  - d. Check sheaves for excessive wear. Submit a work order to replace the sheaves when the belts start riding low.
  - e. Check fan blades for dust buildup and clean if necessary.
  - f. Check fan blades and moving parts for cracks and excessive wear.
  - g. Check mounting bolts, set screws, etc. for security.
  - h. Check condition of extended lubrication lines when present.
  - i. Lubricate fan shaft bearings while unit is running. Do not over lubricate. Remove old or excess lubricant. (See manufacturer literature)
- 4) Clean and service the coils and cooling/heating components:
  - a. Inspect coils and clean by brushing, blowing, vacuuming, or pressure washing if necessary.
  - b. Check coils for leaks and adjust tightness of fittings when required.
  - c. Use fin comb to straighten coil fins. (If necessary)
  - d. For hydronic units, cycle all hydronic water valves two times and check for leaks.

- e. For DX units, check for refrigerant leaks on all lines, valves, fittings, coils, etc. Submit a work order to repair any leaks found.
  - f. Check and repair damaged insulation.
  - g. Check filters and change if necessary.
- 5) Clean and service the condensate catch and removal components:
- a. Flush and clean condensate pans and drains, remove all rust, prepare metal and paint where required.
  - b. Ensure condensate drain lines are clear and free running.
  - c. Treat condensate pans with an EPA approved biocide.
  - d. Service condensate pumps, if equipped.
  - e. Clean the strainers.
- 6) Service the motor:
- a. Clean exterior of motor surfaces of soil accumulation.
  - b. Clean motor ventilation ports.
  - c. Check motor for damage.
  - d. Lubricate motor bearings with Polyrex-EM grease. Don't use fan bearing grease in the motor.
  - e. Check adjustable fan motor base and mounting hardware for damage or loose parts. Tighten as necessary.
  - f. Check grounding straps for tightness.
  - g. Check and record insulation resistance with a megger. Don't megger variable frequency drives.
  - h. Perform corrective measures identified during the pre-work operation test if possible as preventive maintenance. Otherwise, submit a work order for correction.
- 7) Remove tags, perform operational test, and return unit to service.
- a. Check for proper condensate drainage.
  - b. Check for unusual noise or vibration.
  - c. Perform vibration and thermal analysis to verify correction of any pre-test problems.
  - d. Check unit sensors for proper readout at the building automation system.
  - e. Record motor running amps at 100 percent frequency and air loading.

| Equipment  | Manufacturer          | Year Installed | Model | Specs  | Location                    |
|------------|-----------------------|----------------|-------|--|-----------------------------|
| 02-AHU-401 | YORK<br>International | 2006           | P-22  | Serial #04-83650-01,<br>Capacity 4248L/s, Power<br>input 380V~3, 34Amp, 50Hz | NOB 4floor, South Mech room |

|                  |                       |      |                      |   |                               |
|------------------|-----------------------|------|----------------------|---|-------------------------------|
| 02-AHU-402       | YORK<br>International | 2006 | P-22                 | Serial #04-83650-02,<br>Capacity 5663L/s, Power<br>input 380V~3, 40.5Amp,<br>50Hz | NOB 4floor, South Mech room   |
| 02-AHU-403       | YORK<br>International | 2006 | P-22                 | Serial #04-83650-03,<br>Capacity 5663L/s, Power<br>input 380V~3, 40.5Amp,<br>50Hz | NOB 4floor, South Mech room   |
| 02-AHU-404       | YORK<br>International | 2006 | P-20                 | Serial #04-83650-04,<br>Capacity 3020L/s, Power<br>input 380V~3, 27.5Amp,<br>50Hz | NOB 4floor, South Mech room   |
| 02-AHU-405       | YORK<br>International | 2006 | P-40                 | Serial #04-83650-05,<br>Capacity 9203L/s, Power<br>input 380V~3, 70Amp, 50Hz      | NOB 4floor, South Mech room   |
| 02-AHU-406       | YORK<br>International | 2006 | P-40                 | Serial #TCPM331030,<br>Capacity 8495L/s, Power<br>input 380V~3, 56Amp, 50Hz       | NOB 4floor, South Mech room   |
| 02-AHU-407       | YORK<br>International | 2006 | P-22                 | Serial #TCPM331040,<br>Capacity 4248L/s, Power<br>input 380V~3, 34Amp, 50Hz       | NOB 4floor, South Mech room   |
| 02-AHU-408       | YORK<br>International | 2006 | XTI-069X096-FAMA050A | Serial #CPDM XT0144,<br>Capacity 7080L/s, Power<br>input 380V~3, 29Amp, 50Hz      | NOB 4floor, South Mech room   |
| 02-AHU-409       | YORK<br>International | 2006 | XTI-042X036-FAGA050A | Serial #CPDM XT0136,<br>Capacity 1180L/s, Power<br>input 380V~3, 4.4Amp,<br>50Hz  | NOB 4floor, South Mech room   |
| 07-AHU-101       | YORK<br>International | 2006 | AP500 CHNM           | Serial #Z0503070055,<br>Capacity ____L/s, Power<br>input 380V~3, ____Amp,<br>50Hz | Warehouse Maintenance section |
| 07-AHU-201       | YORK<br>International | 2006 | AP500 CHNM           | Serial #Z0503070055,<br>Capacity ____L/s, Power<br>input 380V~3, ____Amp,<br>50Hz | Warehouse                     |
| 04-AHU-101       | YORK<br>International | 2006 | P-18 CL2             | Serial #TCPM331050,<br>Capacity 1967L/s, Power<br>input 380V~3, 14.5Amp,<br>50Hz  | MSGQ 1st floor                |
| Chiller 5-2H-201 | YORK<br>International | 2006 | YCAS0905EB50YGADPC   | Serial #RAPM10461,<br>Capacity 905tons, Power<br>input 380V~3, ____Amp,<br>50Hz   | Utility bldg, roof            |
| Chiller 5-2H-202 | YORK<br>International | 2006 | YCAS0905EB50YGADPC   | Serial #RAPM10462,<br>Capacity 905tons, Power<br>input 380V~3, ____Amp,<br>50Hz   | Utility bldg, roof            |

|                       |                      |      |                     |  |                     |
|-----------------------|----------------------|------|---------------------|--|---------------------|
| Heat Exchanger FC 201 | GENERAL AIR PRODUCTS | 2006 | AFC68CB0G41         | Serial #682060-010-001, 6 motors 1.5HP each, Power input 380V~3, 21.9Amp, 50Hz | Utility bldg, roof  |
| Heat Exchanger FC 202 | GENERAL AIR PRODUCTS | 2006 | AFC68CB0G41         | Serial #682060-040-001, 6 motors 1.5HP each, Power input 380V~3, 21.9Amp, 50Hz | Utility bldg, roof  |
| Heat Exchanger FC 203 | GENERAL AIR PRODUCTS | 2006 | AFC68CB0G41         | Serial #682060-070-001, 6 motors 1.5HP each, Power input 380V~3, 21.9Amp, 50Hz | Utility bldg, roof  |
| Heat Exchanger FC 204 | GENERAL AIR PRODUCTS | 2006 | AFC68CB0G41         | Serial #682060-06-001, 6 motors 1.5HP each, Power input 380V~3, 21.9Amp, 50Hz  | Utility bldg, roof  |
| Exhaust Fan 02-EF-501 | GREENHECK            | 2006 | SWB-212-10-CW-TH-X  | Serial #04H07098, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-502 | GREENHECK            | 2006 | SWB-212-10-CCW-TH-X | Serial #04H07097, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-503 | GREENHECK            | 2006 | GB-360HP-75-X       | Serial #04H08563, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-504 | GREENHECK            | 2006 | GB-180-20-X         | Serial #04H08880, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-505 | GREENHECK            | 2006 | SWB-222-75-CW-BK-Y  | Serial #04H07107, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-506 | GREENHECK            | 2006 | SBE-2H24-5-X        | Serial #04H05946, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-507 | GREENHECK            | 2006 | GB-330-30-X         | Serial #04H08559, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-508 | GREENHECK            | 2006 | GB-330-30-X         | Serial #04H08660, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Roof            |
| Exhaust Fan 02-EF-510 | GREENHECK            | 2006 | GB-420-75-X         | Serial #04H08564, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Lobby exhaust   |
| Exhaust Fan 02-EF-511 | GREENHECK            | 2006 | GB-420-50-X         | Serial #04H08565, Capacity _____, Power input 220V, _____Amp, 50Hz             | NOB Kitchen exhaust |

|               |           |      |                   |   |                        |
|---------------|-----------|------|-------------------|---|------------------------|
| AHU GREENHECK | GREENHECK | 2013 | ERV-521S-15-B-I-S | Serial #11802337,<br>Capacity 2500L/s, Power<br>input 380V~3, 42Amp, 50Hz | Recreation Center roof |
|---------------|-----------|------|-------------------|---|------------------------|